C++ if Statement

The syntax of the if statement is:

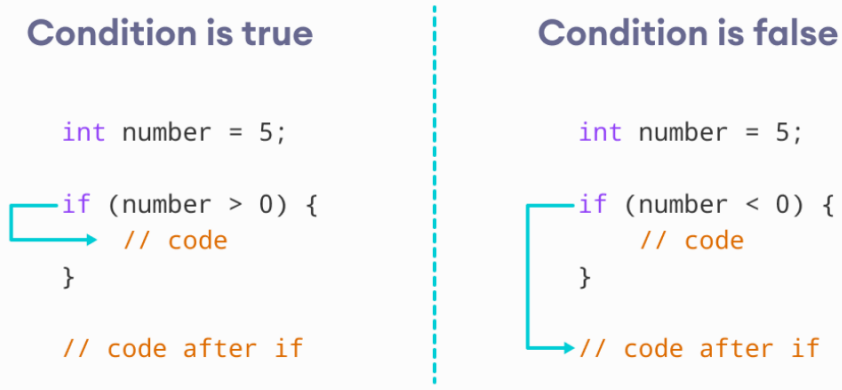
if (condition) { // body of if statement }

The if statement evaluates
the condition inside the parentheses ( ).

- If the condition evaluates to true, the code inside the body of if is executed.

- If the condition evaluates to false, the code inside the body of if is skipped.

Note: The code inside { } is the body of the if statement.



Example 1: C++ if Statement

```
// Program to print positive number entered by the user
// If the user enters a negative number, it is skipped

#include <iostream>
using namespace std;

int main() {

  int number;
```

```
  cout << "Enter an integer: ";
  cin >> number;

  // checks if the number is positive
  if (number > 0) {
    cout << "You entered a positive integer: "
<< number << endl;
  }

  cout << "This statement is always
executed.";

  return 0;
}
```

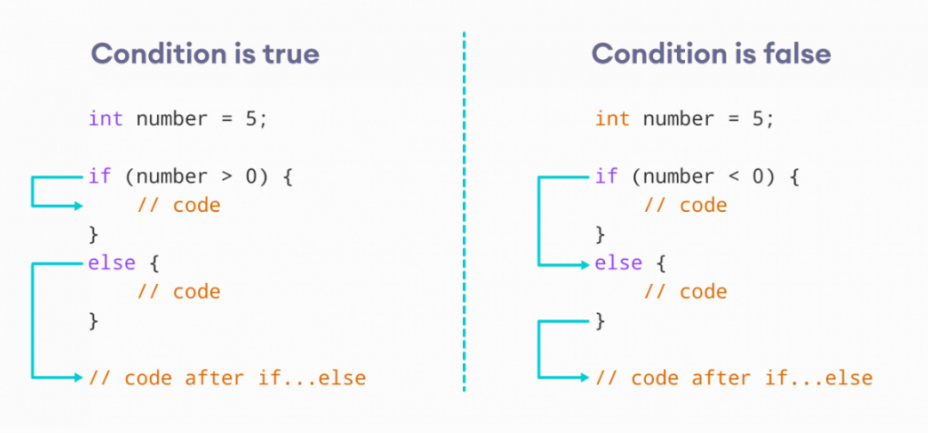
C++ if...else

The if statement can have an optional else clause. Its syntax is:

```
if (condition) { // block of code if condition
```

is true } else { // block of code if condition is false }

The if..else statement evaluates the condition inside the parenthesis.



How if...else Statement Works

If the condition evaluates true,

- the code inside the body of if is executed

- the code inside the body of else is skipped from execution

If the condition evaluates false,

- the code inside the body of else is executed
- the code inside the body of if is skipped from execution

Example 2: C++ if...else Statement

```
// Program to check whether an integer is positive or negative
// This program considers 0 as a positive number

#include <iostream>
using namespace std;

int main() {
```

```
  int number;

  cout << "Enter an integer: ";
  cin >> number;

  if (number >= 0) {
    cout << "You entered a positive integer: "
<< number << endl;
  }
  else {
    cout << "You entered a negative integer:
" << number << endl;
  }

  cout << "This line is always printed.";

  return 0;
}
```

C++ if...else...else if statement

The if...else statement is used to execute a block of code among two alternatives. However, if we need to make a choice between more than two alternatives, we use the if...else if...else statement.

The syntax of the if...else
if...else statement is:

```
if (condition1)
{
// code block 1
 }
else if (condition2)
{
// code block 2
}
else {
// code block 3
}
```

C++ if, if...else and Nested if...else

In this tutorial, we will learn about the if...else statement to create decision making programs with the help of examples.

In computer programming, we use the if...else statement to run one block of code under certain conditions and another block of code under different conditions.

For example, assigning grades (A, B, C) based on marks obtained by a student.

- if the percentage is above **90**, assign grade **A**
- if the percentage is above **75**, assign grade **B**
- if the percentage is above **65**, assign grade **C**

There are three forms of if...else statements in C++.

- if statement

- if...else statement

- if...else if...else statement

C++ if Statement

The syntax of the if statement is:

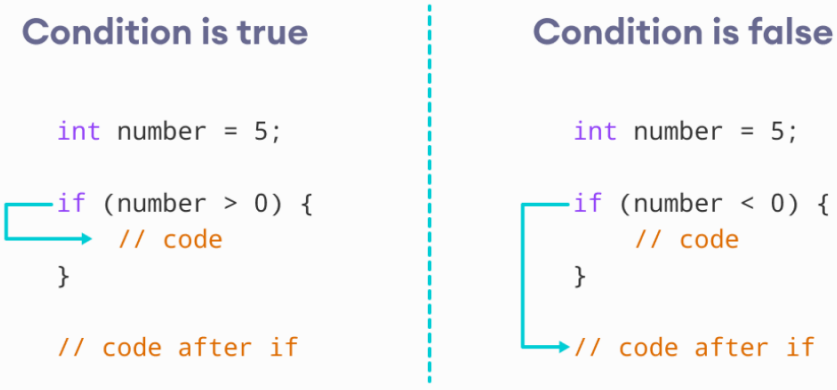
if (condition) { // body of if statement }

The if statement evaluates
the condition inside the parentheses ( ).

- If the condition evaluates to true, the code inside the body of if is executed.

- If the condition evaluates to false, the code inside the body of if is skipped.

Note: The code inside { } is the body of the if statement.



How if Statement Works

Example 1: C++ if Statement

// Program to print positive number entered by the user // If the user enters a negative number, it is skipped #include <iostream> using namespace std; int main() { int number; cout << "Enter an integer: "; cin >> number; // checks if the number is positive if (number > 0) { cout << "You entered a positive integer: " << number << endl; } cout << "This statement

is always executed."; return 0; }

Run Code

Output 1

Enter an integer: 5 You entered a positive number: 5 This statement is always executed.

When the user enters 5, the condition number > 0 is evaluated to true and the statement inside the body of if is executed.

Output 2

Enter a number: -5 This statement is always executed.

When the user enters -5, the condition

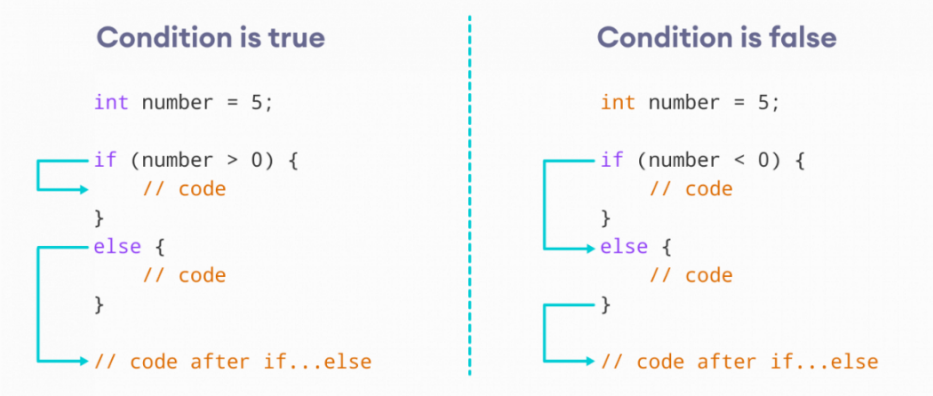
condition number > 0 is evaluated to false and the statement inside the body of if is not executed.

C++ if...else

The if statement can have an optional else clause. Its syntax is:

if (condition) { // block of code if condition is true } else { // block of code if condition is false }

The if..else statement evaluates the condition inside the parenthesis.

- 

How if...else Statement Works

If the condition evaluates true,

- the code inside the body of if is executed
- the code inside the body of else is skipped from execution

If the condition evaluates false,

- the code inside the body of else is executed
- the code inside the body of if is skipped from execution

Example 2: C++ if...else Statement

// Program to check whether an integer is positive or negative // This program considers 0 as a positive number #include <iostream> using namespace std; int main() { int number; cout << "Enter an integer: "; cin >> number; if (number >= 0) { cout << "You entered a positive integer: " << number << endl; } else { cout << "You entered a negative integer: " << number << endl; } cout << "This line is always printed."; return 0; }

Run Code

Output 1

Enter an integer: 4 You entered a positive integer: 4. This line is always printed.

In the above program, we have the

condition number >= 0. If we enter the number greater or equal to 0, then the condition evaluates true.

Here, we enter 4. So, the condition is true. Hence, the statement inside the body of if is executed.

Output 2

Enter an integer: -4 You entered a negative integer: -4. This line is always printed.

Here, we enter -4. So, the condition is false. Hence, the statement inside the body of else is executed.

C++ if...else...else if statement

The if...else statement is used to execute a

block of code among two alternatives. However, if we need to make a choice between more than two alternatives, we use the if...else if...else statement.

The syntax of the if...else if...else statement is:

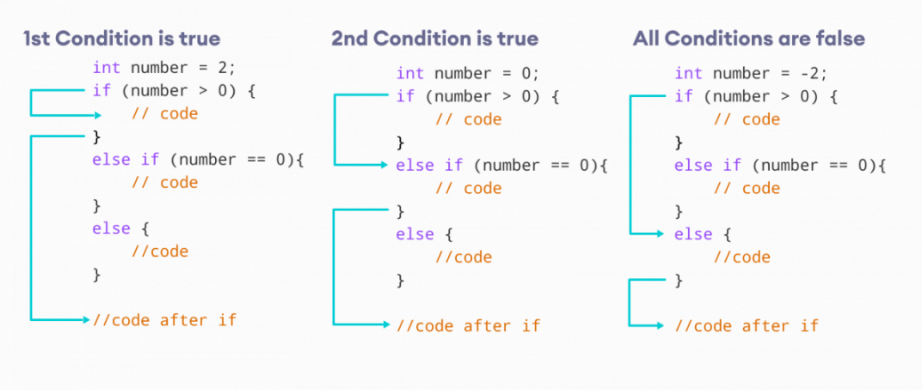
if (condition1) { // code block 1 } else if (condition2){ // code block 2 } else { // code block 3 }

Here,

- If condition1 evaluates to true, the code block 1 is executed.
- If condition1 evaluates to false, then condition2 is evaluated.
- If condition2 is true, the code block 2 is

executed.

- If condition2 is false, the code block 3 is executed.

- 

  How if...else if...else Statement Works

Note: There can be more than one else if statement but only
one if and else statements.

- **Example 3: C++ if...else...else if**

// Program to check whether an integer is positive, negative or zero

```
#include <iostream>
using namespace std;

int main() {

  int number;

  cout << "Enter an integer: ";
  cin >> number;

  if (number > 0) {
    cout << "You entered a positive integer: "
<< number << endl;
  }
  else if (number < 0) {
    cout << "You entered a negative integer:
" << number << endl;
  }
  else {
    cout << "You entered 0." << endl;
```

```
  }

  cout << "This line is always printed.";

  return 0;
}
```

C++ Nested if...else

Sometimes, we need to use
an if statement inside
another if statement. This is known as
nested if statement.

Think of it as multiple layers
of if statements. There is a first,
outer if statement, and inside it is another,
inner if statement. Its syntax is:

```
// outer if statement
 if (condition1)
```

```
{
 // statements
          // inner if statement
              if (condition2)
                   {
                   // statements
                    }
}
```

Notes:

- We can add else and else if statements to the inner if statement as required.

- The inner if statement can also be inserted inside the outer else or else if statements (if they exist).

- We can nest multiple layers of if statements.

Example 4: C++ Nested if

```
// C++ program to find if an
integer is positive, negative or
zero
// using nested if statements

#include <iostream>
using namespace std;

int main() {

  int num;

  cout << "Enter an integer: ";
   cin >> num;
```

```
  // outer if condition
  if (num != 0) {

    // inner if condition
    if (num > 0) {
      cout << "The number is
positive." << endl;
    }
    // inner else condition
    else {
      cout << "The number is
negative." << endl;
    }
  }
  // outer else condition
  else {
```

```
    cout << "The number is 0 and
it is neither positive nor
negative." << endl;
  }

  cout << "This line is always
printed." << endl;

  return 0;
}
```